

AMENDMENTS IN THE CLAIMS

Please amend claims 3, 6, 27 and 36 by this amendment as follows and cancel claims 2, 9 and 23-25 without prejudice or disclaimer as to their subject matter by this amendment as follows:

1 1. (Previously canceled)

1 2. (Canceled)

1 3. (Currently Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said
10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice
11 complex holes, wherein each one of said plurality of ink feed holes is formed at a center portion
12 of a corresponding one of said plurality of chamber-orifice complex holes, and each one of said
13 plurality of said heaters surrounds corresponding ones of said plurality of ink feed holes. The ink-

14 ~~jet printhead of claim 2~~, wherein each one of said plurality of heaters is of an omega shape that
15 surrounds said corresponding ink feed hole.

1 4-5. (Previously canceled)

2 6. (Currently Amended) An ink-jet printhead, comprising:

3 a substrate being a single integrated monolithic and homogenous unit of silicon, said
4 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
5 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said
10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice
11 complex holes, wherein each one of said plurality of ink feed holes is formed at a center portion
12 of a corresponding one of said plurality of chamber-orifice complex holes, and each one of said
13 plurality of said heaters surrounds corresponding ones of said plurality of ink feed holes The ink-
14 jet printhead of claim 2, wherein each chamber-orifice has a truncated conical shape, wherein a
15 lower end of said chamber orifice facing said substrate faces the corresponding ink feed hole and
16 heater formed on the substrate and the other end having a smaller diameter faces toward an

17 outside of said ink-jet printhead.

1 7-8. (Previously canceled)

1 9. (Canceled)

1 10-22. (Previously canceled)

1 23-25. (Canceled)

1 26. (Previously canceled)

1 27. (Currently Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality of ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said

10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice
11 complex holes, said nozzle plate being a single integrated monolithic and homogenous unit, each
12 chamber-orifice hole having a cylindrical shaped portion on a portion of said chamber-orifice
13 hole closest to a side of said nozzle plate that attaches to said substrate and a conical shaped
14 portion on a portion of said chamber-orifice hole closest to a side of said nozzle plate opposite
15 from where said nozzle plate attaches to said front surface of said substrate, said conical shaped
16 portion being a section of a right circular cone with an axis perpendicular to said front surface of
17 said substrate and perpendicular to said surfaces of said nozzle plate;
18 ~~said ink-jet printhead being manufactured by a process geared for mass production, said process~~
19 ~~comprising the steps of:~~
20 ~~—— etching said channel into a rear surface of said substrate;~~
21 ~~—— etching a plurality of holes through to said front surface of said substrate to perforate said~~
22 ~~substrate;~~
23 ~~—— depositing a first plurality of signal lines and a second plurality of signal lines on said~~
24 ~~front surface of said substrate, each one of said first plurality of signal lines terminating near~~
25 ~~termination points of corresponding ones of said second plurality of signal lines, each of said~~
26 ~~terminating portions of said first and said second signal lines terminating near at least one of said~~
27 ~~plurality of holes perforating said front surface of said substrate;~~
28 ~~—— depositing said heaters made of a resistive material onto said front surface of said~~
29 ~~substrate so as to said connect terminating ends of each one of said first plurality of signal lines~~
30 ~~with corresponding terminating ends of said second plurality of signal lines, said resistive~~

31 material being near to at least one of said plurality of holes perforating said front surface of said
32 substrate; and

33 ————— attaching said nozzle plate perforated by said plurality of nozzle holes onto said front
34 surface of said substrate so that each one of said plurality of nozzle holes is aligned to
35 corresponding ones of terminating ends of said first and said second signal lines, said resistive
36 material, and at least one of said plurality of holes perforating said front surface of said substrate,
37 said resistive material being essentially omega in shape and surrounding corresponding ones of
38 said plurality of holes perforating said front surface of said substrate.

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1 28-35. (Previously canceled)

1 36. (Currently Amended) An ink-jet printhead, comprising:

2 a substrate being a single integrated monolithic and homogenous unit of silicon, said
3 substrate, having a rear surface, said rear surface having a channel having a predetermined depth,
4 wherein a plurality of ink feed holes are formed on a bottom of the channel perforating said
5 substrate;

6 a nozzle plate coupled to a front surface of the substrate, said nozzle plate being
7 perforated by a plurality of chamber-orifice complex holes, wherein each chamber-orifice
8 complex hole corresponds to at least one of said plurality ink feed holes; and

9 a plurality of heaters disposed on the front surface of the substrate, each one of said
10 plurality of heaters being located near corresponding ones of said plurality of chamber-orifice

11 complex holes, wherein each one of said plurality of ink feed holes is formed at a center portion
12 of a corresponding one of said plurality of chamber-orifice complex holes, and each one of said
13 plurality of said heaters surrounds corresponding ones of said plurality of ink feed holes. The ink-
14 jet printhead of claim 2, said nozzle plate being a single integrated monolithic and homogenous
15 unit, each chamber-orifice hole having a cylindrical shaped portion on a portion of said chamber-
16 orifice hole closest to a side of said nozzle plate that attaches to said substrate and a conical
17 shaped portion on a portion of said chamber-orifice hole closest to a side of said nozzle plate
18 opposite from where said nozzle plate attaches to said front surface of said substrate.

1 37. (Previously Amended) The ink-jet printhead of claim 36, said cylindrical shaped
2 portion of each chamber-orifice hole having an axis that is perpendicular to said front surface of
3 said substrate and perpendicular to surfaces of said nozzle plate.